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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,878	11/20/2003	Jeffrey Scott Cross	032122	5639

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EXAMINER	
PHAM, HOAI V	

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/716,878	CROSS ET AL.
	Examiner	Art Unit
	Hoai v. Pham	2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *5-7 and 10-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,8 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-4, 8, and 9 in the reply filed on July 12, 2005 is acknowledged.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. [U.S. Pat. 6,348,368] in view of Torii et al. [U.S. Pat. 6,432,767].

With respect to claim 1, Yamazaki et al. (fig. 4) discloses a semiconductor device comprising:

a substrate (401);

a capacitor (148) on the substrate (fig. 3C, col. 8, line 55); and

a stress application layer (402) which actively applies tensile or compressive stress to the capacitor by deforming the substrate.

Yamazaki et al. does not disclose the capacitor including a ferroelectric film. However, Torii et al. discloses that ferroelectric film (44) is well known in the art to use in a capacitor dielectric (col. 5, lines 24-35). Therefore, it would have been obvious to one having ordinary skill in the art to use the ferroelectric film as taught by Torii et al. into the device of Yamazaki et al. in order to provide the known purpose of reducing the thickness of the capacitor dielectric and increase capacitance of the capacitor.

With respect to claim 2, Yamazaki et al. (fig. 4) discloses that the stress application layer (402) is provided on a surface of the substrate (401).

With respect to claim 3, Yamazaki et al. (fig. 4) discloses that the stress application layer contains a film (402) formed on the substrate surface, and having a

coefficient of thermal expansion different from a coefficient of thermal expansion of the substrate. Yamazaki et al. does not explicitly disclose the thickness of the stress application layer (402) having a thickness in a range of 1 micrometer to 5 micrometers. However, the thickness range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

With respect to claim 4, Yamazaki et al. (fig. 4) discloses a semiconductor device comprising:

a semiconductor substrate (401);

gate electrode (116) and diffusion regions (130, 131) formed on the substrate (401) (fig. 3);

a capacitor including a lower electrode layer, a dielectric film and an upper electrode layer, which are stacked over the substrate sequentially and connected to the diffusion regions (fig. 3); and

a stress application layer (402) applying tensile or compressive stress to the the capacitor, wherein the stress application layer contains a film formed on a back surface

of the substrate, and having a coefficient of thermal expansion different from a coefficient of thermal expansion of the substrate.

Yamazaki et al. does not disclose the capacitor including a ferroelectric film. However, Torii et al. discloses that ferroelectric film (44) is well known in the art to use in a capacitor dielectric (col. 5, lines 24-35). Therefore, it would have been obvious to one having ordinary skill in the art to use the ferroelectric film as taught by Torii et al. into the device of Yamazaki et al. in order to provide the known purpose of reducing the thickness of the capacitor dielectric and increase capacitance of the capacitor.

Yamazaki et al. does not explicitly disclose the thickness of the stress application layer (402) having a thickness in a range of 1 micrometer to 5 micrometers. However, the thickness range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

With respect to claims 8 and 9, as reason given above, Torii et al. discloses that ferroelectric film (44) contains an oxide which has one of a perovskite crystal structure, $Pb(Zr_{1-x}Ti_x)O_3(0\leq x\leq 1)$ (col. 5, lines 25-30).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HOAI PHAM
PRIMARY EXAMINER